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EXAMINER

ENGLUND, TERRY LEE

ART UNIT PAPER NUMBER

2816

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/609,038

Applicant(s)

TSENG ET AL.

Examiner

Terry L. Englund

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-25, and 27-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-6,8-10,12-20 and 23-25 is/are allowed.
- 6) ☒ Claim(s) 7,21,22 and 35-39 is/are rejected.
- 7) ☒ Claim(s) 2 and 27-34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The amendment submitted on Apr 25, 2006 has been reviewed and considered with the following results:

The cancellation of claim 26 rendered its objection and rejection moot.

The amended claims overcame all of the objections described in the previous Office Action. Although those objections to claims 1-10, 12-25, and 27-34 have now been withdrawn, some other objections were noted when all the active claims were reviewed. These objections are described later under the appropriate section.

The amended claims also overcame most of the rejections of claims 1-9, 12-22, 24-25, and 28-30 under 35 U.S.C. 112 as described in the previous Office Action. The “a first voltage” rejection of claim 7, and the “a change of the supply signal” rejections of both claims 21 and 22, have been maintained. These rejections are described later under the appropriate section, wherein all the other 35 U.S.C. 112 rejections described in the previous Office Action have been withdrawn.

Amended claims 1, 29 and 31 overcame the rejections of claims 1, 4, 6, 14, 17, 29, and 31 under 35 U.S.C. 103(a) with respect to Kawai/Chou. Those rejections have been withdrawn because: 1) the threshold-enhancement node (as now recited within claim 1) is clearly within the Schmitt trigger circuit, wherein the node cited in the previous Office Action’s rejections, with respect to Kawai, is the node between resistors R1-R2 of voltage divider 70-72; 2) voltage divider 70-72 does not include a current source transistor, which claim 29 now requires after

Art Unit: 2816

being made to depend on claim 28; or 3) voltage divider 70-72 does not include a compensate circuit, which claim 31 now requires after being made to depend on claim 30.

As admitted by the applicant on page 14 of the amendment, “new claims 35-39 correspond to versions of objected-to claims 2, 3, 5, 7 and 8, with the subject matter of claim 1 (as it existed before the Amendment of October 18, 2005).” When considering these newly added claims, it was noted they correspond to claims in an amendment submitted on Jan 10, 2005. However, claims 2, 3, 5, 7, and 8 of that amendment depended on a broader independent claim 1 (i.e. the subject matter requires no first/second voltages, or power down/sleep modes). Therefore, claims 2, 3, 5, 7, and 8 in the Jan 10th amendment had been rejected in the Office Action mailed May 18, 2005, and these rejections are basically repeated later under the appropriate section, with some modifications made to account for the new claim numbers, a few minor word changes with respect to the limitations now claimed, and/or to help further clarify the examiner’s interpretation of the recited limitations and prior art references.

Claim Objections

Claims 2, 21-22, 27-35, and 37-39 are objected to because of the following informalities: An inadvertent error appears to have been made within claim 2, wherein the previous version of the claim cited “generating a reset”, wherein lines 2-3 of the present claim cites only “generating reset” with no indication a change was made to the claim. Therefore, it is suggested --a-- be added prior to “reset” on line 3 to return the claim back to its previously presented version, and to improve word flow. The previous change of “a” to “the” on line 3 of claim 21 is now shown as “a the” on claim 21’s line 4. It is suggested the “a” be deleted to improve word flow, and return that particular wording back to its previous version. Apparently related to a suggested

Art Unit: 2816

change made in the previous Office Action with respect to claim 21 (i.e. adding --is-- prior to “operative”), claim 22 was amended to cite “is operative” on line 2. However, that change made the wording on line 2 awkward. Therefore it is suggested that “is” be deleted from claim 22’s line 2. [Note: Claim 22 depends on claim 14 that does not cite “a reset signal node”, wherein claim 21 depends on claim 20 which cites “a reset signal node” phrase.] To minimize possible confusion with respect to what “an input” refers to on line 5 of each of claims 27, 28, 30, 32, and 33, it is suggested a comma be added after both “input” and “output” on line 5 of each of those claims to address/correct an oversight by the examiner (e.g. it had not been described in a previous Office Action). With these changes, the phrasing within those claims will now read --an input, and not controlled by an output, of the Schmitt-trigger circuit--, thus more clearly relating both the “input” and the “output” to the Schmitt-trigger circuit. To improve word flow within claim 35, it is suggested --a-- be added prior to “reset” on line 6. Line 5 of each of claims 37-39 should have the extra comma from “signal,,” deleted to address an oversight. Dependent claims carry over any objection(s) from any claim(s) upon which they depend. Appropriate corrections are required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7, 21-22 remain rejected, and new claim 35 is rejected, under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. Although each of amended claims 19, 20, and 22 had the same type of phrasing corrected, it is still not understood how “a first

Art Unit: 2816

voltage” on line 3 of claim 7 relates to “a first voltage” now recited on line 4 of amended claim 1. For example, do they refer to the same voltage, or to different voltages? It is suggested “first voltage” within claim 7 be changed to --first potential-- (e.g. the same type of change that had been made to claims 19, 20, and 22). It is not understood what the wording on line 2 of claim 21 is now meant to be. In the previous version of the claim, “the Schmitt trigger circuit further comprises a reset signal node operative” had been changed to --the reset signal node operative--. However, the present claim 21 now cites “the Schmitt trigger circuit further comprises a reset signal is operative” with no indication any change, other than adding “is”, was meant. Therefore, what language (i.e. phrasing) is meant to be in line 2 of claim 21 now? For example, how does “a reset signal node” of the present claim 21 relate to “a reset signal node” cited in claim 20, line 2? Claim 21 does not clearly relate how “a change of the supply signal” on lines 3 and 5 relate to one another. If the changes are not the same (e.g. one is an increase, and one is a decrease), it is suggested “a change” on line 5 be changed to either --another change-- or to --a different change--. Lines 3 and 4-5 of claim 22 have the same “a change of the supply signal” problems as claim 21 described above. The phrasing “and further comprising” on line 5 of claim 35 implies the voltage divider has already been clearly identified as comprising at least one other element. However, the previous wording related to the voltage divider does not indicate it comprises anything else, and merely indicates it is connected to the Schmitt-trigger circuit, and tracks a supply signal.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2816

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Newly added claims 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al. (Smith), a reference cited in a previous Office Action (e.g. see the PTO-892 of paper no. 09122004). Fig. 3 shows a power-on reset circuit comprising Schmitt trigger circuit 46 and voltage divider 51,50,44 connected to input 52 of Schmitt trigger circuit 46. Fig. 8 shows an example of Schmitt trigger circuit 46 comprising a plurality of MOS devices (e.g. the plurality can be considered as comprising all of CMOS devices M20-M24,H25; only PMOS devices M20-M21,M24; or only NMOS devices M22-M23,H25). Since the reference does not indicate the MOS devices have different threshold values, each device is considered as having the same threshold V_t (e.g. within acceptable fabrication tolerances; also, even if one of ordinary skill in the art would consider PMOS transistors as having a different threshold voltage than NMOS transistors, the devices of the same conductivity (e.g. PMOS device M20-21,M4) would have the same threshold voltage). From the circuitry and waveforms shown in the figures, one of ordinary skill in the art would understand the devices determine the power reset trigger level. Using Fig 10 as a reference, reset signal 88 transitions from a low to high level once the power supply (represented by the solid “86,88” line) has reached a power-up threshold greater than midpoint 92 of the nominal power supply voltage range, and reset signal 88 transitions from a high to a low level once the power supply has decreased below a power-down threshold that is less than midpoint 92 (e.g. see column 10, lines 28-43). Section 51 of voltage divider 51,50,44 provides signals trgrdn and trgrup, which track (e.g. are proportional to) supply signal VDD (e.g. see columns 6 (lines 38-41) and 7 (lines 710)). Fig. 4 shows a temperature and voltage compensated

Art Unit: 2816

reference generator circuit 62 (e.g. see column 7, lines 47-51) that provides its signal v_{ref} to voltage divider section 44, and it is operatively coupled to Schmitt trigger circuit 46. Deeming the Fig. 4 circuit as a compensate circuit, it effectively compensates for temperature and supply signal variations. When the compensate circuit of Fig. 4 is considered to be part of the voltage divider, it effectively adjusts a feedback current (e.g. via 54, 50, 60, and 52) to help restore (e.g. maintain) voltage v_{pupdn} at input 52 of Schmitt trigger circuit 46, anticipating claim 37.

Referring to Figs. 3 and 11, Schmitt trigger circuit 46 has reset signal node 54 that provides a reset signal 88 (e.g. $pwrenb$) that rises from ground potential (e.g. a logic low) to a first voltage (e.g. a logic high) when supply signal 86 has increased enough to favorably compare to a first threshold voltage 96 (e.g. $signal\ 86 > voltage\ 96$); and reset signal node 54 drops from the first voltage to the ground potential when supply signal 86 does not compare favorably to the first threshold voltage 96 since $voltage\ 98 < voltage\ 96$. The Smith reference does not clearly show or disclose a sleep mode. Therefore, one of ordinary skill in the art could consider Smith's power-on reset circuit' operation corresponds to the normal operation of a power-on reset circuit that includes only power-up and power-down modes, and does not include a sleep mode.

Without the sleep mode, the circuit cannot enter into it, and claim 38 is anticipated. Interpreting Fig. 11 in a slightly different manner, and also referring to Fig. 10, one of ordinary skill in the art would understand Schmitt trigger circuit 46 has a first voltage peak (e.g. 98 of Fig. 11 corresponds to the power-down threshold level shown in Fig. 10 that is represented by the intersection of lines 88 and 86 shown below 92), and a second voltage peak (e.g. 96 of Fig. 11 corresponds to the power-up threshold level shown in Fig. 10 that is represented by the intersection of lines 86 and 88 shown above 92). Since 98 corresponds to when Schmitt trigger

Art Unit: 2816

circuit 46 enters a power-down mode, and 96 corresponds to when Schmitt trigger circuit 46 exits the power-down mode (e.g. returns to a normal, active operation), claim 39 is anticipated because second voltage peak 96 is greater than first voltage peak 98.

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

New claim 36 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Smith et al. (Smith). As previously described, Smith shows a power-on reset circuit in Fig. 3 comprising Schmitt trigger circuit 46 and voltage divider 51,50,44. Voltage divider section 44 is shown in Fig. 7 comprising current source transistors M15 and M18 that will generate current in response to the supply signal, thus anticipating claim 36. However, voltage divider section 51 shown in Fig. 3 can be modified to include a current source transistor. For example, it would have been obvious to one of ordinary skill in the art to replace at least one of resistors R3-R5 with a corresponding transistor receiving a respective bias voltage to control its resistance. Each transistor can be deemed a current source transistor that will generate current (e.g. allow current to flow through it) in response to the supply signal, thus rendering claim 36 obvious. By replacing at least one of resistors R3-R5 with a transistor, the trigger voltages trgrdn and trgrup can be adjusted to desired levels. For example, perhaps the power-up level is not what was initially expected. Therefore, if voltage divider section 51 has at least one (current source) transistor within its current path, the power-up level can be adjusted by

Art Unit: 2816

changing the bias voltage to the transistor(s) to meet a required level. The more resistors that are replaced by a corresponding transistor, the more accurate the trigger levels can be set after fabrication.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Newly added claims 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slamowitz et al. (Slamowitz), in view of Smith et al. (Smith), wherein both of these references had been cited in a previous Office Action (e.g. see the PTO-892 of paper no. 09122004). Fig. 4 of Slamowitz shows a power-on reset circuit comprising Schmitt trigger circuit 442 for determining a power reset trigger level of signal schmit_out; and voltage divider 410,412 is connected to the input of Schmitt trigger circuit 442. As shown in Fig. 5, and understood by one of ordinary skill in the art, voltage divider section 412 tracks supply signal

Art Unit: 2816

Vddc. However, the reference of Slamowitz does not show or disclose Schmitt trigger circuit 442 constructed with a plurality of MOS devices. Fig. 8 of Smith shows Schmitt trigger circuit 46 comprising a plurality of MOS devices (e.g. CMOS devices M20-M24,H25; PMOS devices M20-M21,M24; or NMOS M22-M23,H25). Therefore, it would have been obvious to one of ordinary skill in the art to replace Slamowitz's Schmitt trigger circuit 442 with Smith's Schmitt trigger circuit 46. Since Smith does not indicate the threshold voltages of the MOS devices are different from one another, they are considered as having the same threshold V_t (e.g. within acceptable fabrication tolerances; or if considering the plurality of devices as comprising only those of the same conductivity (e.g. PMOS device M20-M21,M24) they will all have the same threshold). One of ordinary skill in the art knows a Schmitt trigger has a power-up threshold higher than its power-down threshold, with respect to the power reset trigger level. Slamowitz's 438 can be considered one type of a compensate circuit that compensates for temperature and supply signal variations (e.g. see paragraph 0042, wherein it is understood that changes in temperature can also affect and/or cause power supply type changes). The on/off operation of 438 will generate what can be deemed a "reset pulse", and since it is operatively coupled to the Schmitt trigger circuit, claim 35 is rendered obvious. The use of Smith's Schmitt trigger circuit simply replaces the generic Schmitt trigger circuit of Slamowitz (e.g. details of that circuit is not shown/disclosed) with one specific, known Schmitt trigger circuit. Voltage divider section 412 includes current source transistors 434 and 414, which generate a current in response to supply signal vddc, and claim 36 is rendered obvious. Transistor 438, included in voltage divider 410,412, provides one type of compensate circuit that adjusts a feedback current to help restore (e.g. maintain) the voltage at the input of Schmitt trigger circuit 442 in response to supply signal

Art Unit: 2816

fluctuations (e.g. see paragraph 0042, wherein one of ordinary skill in the art would understand the phrase “prevent false re-triggering” is one way of stating the signal is not changed enough to cause inaccurate triggering of the power-on reset circuit). Therefore, claim 37 is rendered obvious. Since the Slamowitz/Smith configuration is understood to operate as a power-on reset circuit with power-up and power-down modes, it will not enter a sleep mode. Therefore, one of ordinary skill in the art will understand that the Schmitt trigger circuit will comprise a reset signal node that has a signal that will rise from a ground potential (e.g. a logic low) to a first voltage (e.g. a logic high) as the supply signal increases and it compares favorably with a first threshold voltage (e.g. it's equal to, or greater than, the power-up threshold). Also, the signal at the reset signal node will drop from the first voltage to the ground potential when the supply signal does not compare favorably to the first threshold voltage (e.g. it's below the first threshold voltage by a predetermined amount), thus rendering claim 38 obvious. Understanding the operation of a Schmitt trigger circuit, one of ordinary skill in the art will know that the signal on a reset signal node has a first voltage peak (e.g. power-down threshold level) when the Schmitt trigger circuit enters a power-down mode, and a second voltage peak (e.g. power-up threshold level), greater than the first voltage peak, when the Schmitt trigger circuit exits the power-down mode (e.g. enters the active mode). Therefore, claim 39 is rendered obvious.

Claims 11 and 26 have been cancelled.

Allowable Subject Matter

Claims 1, 3-6, 8-10, 12-20, and 23-25 are allowed. There is no motivation to modify or combine any prior art reference(s) to ensure the power-on reset circuit, with a Schmitt trigger circuit and voltage divider, also comprises: 1) a threshold-enhancement node that has a first or

Art Unit: 2816

second voltage when the Schmitt trigger circuit is in a corresponding power-down/sleep mode as recited within claim 1, upon which claims 3-6, 8-9, 14-20 depend. Also, there is no strong motivation to modify or combine any prior art reference(s) to ensure the method for providing a reset signal also includes the specific relationships between the reset signal, reference/first/second potentials, sleep mode, and the power-up/power-down states as recited within each of independent method claims 10 (upon which claims 12-13 depend) and 23 (upon which claims 24-25 depend).

Claims 2, and 27-34 are only objected to, but would be allowable if their respective objection(s) described previously, are satisfactorily addressed/corrected. Claim 2 depends on allowed claim 1. There is no motivation to modify or combine any prior art reference(s) to ensure the power-on reset circuit, with a Schmitt trigger circuit and voltage divider, also comprises: resistors of the voltage divider being connected directly to the Schmitt trigger circuit and: a) the compensate circuit as recited within claims 27 and 30 (upon which claim 31 depends), b) the current source transistor as recited within claim 28 (upon which claim 29 depends), c) the reset signal node's potential with respect to the Schmitt trigger and sleep mode as recited within claim 32, or d) the reset signal node's voltage peak with respect to the Schmitt trigger circuit's entering/exiting of the power-down mode as recited within claim 33 (upon which claim 34 depends).

Claims 7, and 21-22 would be allowable if satisfactorily rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claims 7, 21, and 22 depend on allowed claims 1, 20, and 14, respectively.

Response to Comments

Comments on page 14 of the amendment indicate the applicants apparently believe the newly added claims that incorporate the limitations of claims 2-3, 5, 7, and 8, which had only been objected to in the previous Office Action, would make the new independent claims allowable. However, the limitations of those claims were merely combined with the broader limitations of a previous version of claim 1 as described on previously on page 3 of this Office Action, under the Response to Amendment section.

Therefore, the applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). The applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication, or previous communications, from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

Art Unit: 2816

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (571) 272-1740.

The new central official fax number is (571) 273-8300.

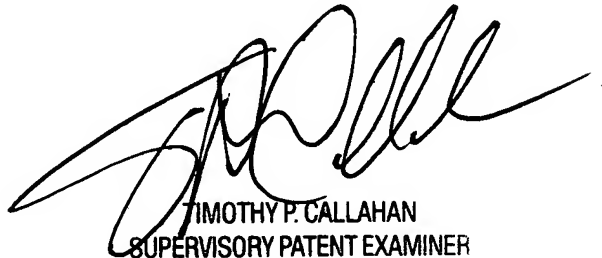
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TLE

Terry L. Englund

7 July 2006



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